ARCHIVE

for

RATIONAL MECHANICS

and

ANALYSIS

Edited by

C. TRUESDELL & J. SERRIN

Volume 57

SPRINGER-VERLAG
BERLIN · HEIDELBERG · NEW YORK
1974/75

With the acceptance of a manuscript or publication, the publishers acquire the sole copyright for all languages and countries, including all rights of photocopying or reproduction by any other method, even in microform.

Alle Rechte, einschließlich das der Übersetzung in fremde Sprachen und das der photomechanischen Wiedergabe oder einer sonstigen Vervielfältigung, auch in Mikroform, vorbehalten. Jedoch wird gewerblichen Unternehmen für den innerbetrieblichen Gebrauch nach Maßgabe der zwischen dem Börsenverein des Deutschen Buchhandels e. V. und dem Bundesverband der Deutschen Industrie abgeschlossenen Rahmenabkommens die Anfertigung einer photomechanischen Vervielfältigung gestattet. Wenn für diese Zeitschrift kein Pauschalabkommen mit dem Verlag vereinbart worden ist, ist eine Wertmarke im Betrage von DM 0,40 pro Seite zu verwenden. *Der Verlag läßt diese Beträge den Autorenverbänden zufließen.*

Springer-Verlag Berlin · Heidelberg · New York
Printer: Universitätsdruckerei H. Stürtz AG, Würzburg
Printed in Germany — © by Springer-Verlag Berlin Heidelberg 1974/75

EDITORIAL BOARD

S. AGMON
The Hebrew University
Jerusalem

S. ANTMAN
University of Maryland
College Park

R. ARIS
University of Minnesota
Minneapolis

B. D. COLEMAN
Mellon Institute of Science
Pittsburgh, Pennsylvania

C. DAFERMOS
Brown University
Providence, Rhode Island

A. ERDÉLYI
Mathematical Institute
The University of Edinburgh

J. L. ERICKSEN
The Johns Hopkins University
Baltimore, Maryland

G. FICHERA
Istituto Matematico
Università di Roma

H. GÖRTLER
Institut für Angewandte Mathematik
Universität Freiburg i. Br.

M. E. GURTIN
Carnegie-Mellon University
Pittsburgh, Pennsylvania

D. D. JOSEPH
University of Minnesota
Minneapolis

J. L. LIONS
Département de Mathématiques
Université de Paris

J. B. McLEOD
Oxford University
Oxford, England

I. MÜLLER
The Johns Hopkins University
Baltimore, Maryland

J. C. C. NITSCHE
University of Minnesota
Minneapolis

W. NOLL
Carnegie-Mellon University
Pittsburgh, Pennsylvania

M. M. SCHIFFER
Stanford University
California

J. SERRIN
University of Minnesota
Minneapolis

E. STERNBERG
California Institute of Technology
Pasadena, California

G. STRANG
Massachusetts Institute of Technology
Cambridge, Massachusetts

R. A. TOUPIN
Watson Research Center
Yorktown Heights, New York

C. TRUESDELL
The Johns Hopkins University
Baltimore, Maryland

C.-C. WANG
Rice University
Houston, Texas

Mechanicam vero duplicem Veteres constituerunt: Rationalem *quae per Demonstrationes accurate procedit, & Practicam. Ad practicam spectant Artes omnes Manuales, a quibus utique* Mechanica *nomen mutuata est. Cum autem Artifices parum accurate operari soleant, fit ut* Mechanica *omnis a* Geometria *ita distinguatur, ut quicquid accuratum sit ad* Geometriam *referatur, quicquid minus accuratum ad* Mechanicam. *Attamen errores non sunt Artis sed Artificum. Qui minus accurate operatur, imperfectior est Mechanicus, & si quis accuratissime operari posset, hic foret Mechanicus omnium perfectissimus.* NEWTON

La généralité que j'embrasse, au lieu d'éblouïr nos lumieres, nous découvrira plutôt les véritables loix de la Nature dans tout leur éclat, & on y trouvera des raisons encore plus fortes, d'en admirer la beauté & la simplicité. EULER

... ut proinde his paucis consideratis tota haec materia redacta sit ad puram Geometriam, quod in physicis & mechanicis unice desideratum. LEIBNIZ

The ARCHIVE FOR RATIONAL MECHANICS AND ANALYSIS nourishes the discipline of mechanics as a deductive, mathematical science in the classical tradition and promotes pure analysis, particularly in contexts of application. Its purpose is to give rapid and full publication to researches of exceptional moment, depth, and permanence.

Each memoir must meet a standard of rigor set by the best work in its field. Contributions must consist largely of original research; on occasion, an expository paper may be invited.

English, French, German, Italian, and Latin are the languages of the Archive. Authors are urged to write clearly and well, avoiding an excessively condensed or crabbed style. The editors reserve the right to return to authors manuscripts found deficient in style, form, or clarity.

Manuscripts intended for the Archive should be submitted to an appropriate member of the Editorial Board.

CONTENTS OF VOLUME 57

CAPRIZ, G., & P. PODIO GUIDUGLI, On Signorini's Perturbation Method in Finite Elasticity 1

DUNWOODY, J., Errata: One Dimensional Shock Waves in Heat Conducting Materials with Memory 385

DUSSAN V., E. B., Hydrodynamic Stability and Instability of Fluid Systems with Interfaces 363

GURTIN, MORTON E., & A. IAN MURDOCH, A Continuum Theory of Elastic Material Surfaces 291

HABETLER, G. J., & B. J. MATKOWSKY, On the Validity of a Nonlinear Dynamic Stability Theory 166

HERSCH, J., L. E. PAYNE & M. M. SCHIFFER, Some Inequalities for Stekloff Eigenvalues 99

KARTSATOS, A. G., Banach Space-Valued Solutions of Differential Equations Containing a Parameter 142

KIELHÖFER, H., Stability and Semilinear Evolution Equations in Hilbert Space 150

LIANIS, G., & D. WHICKER, Electromagnetic Phenomena in Rotating Media 325

MARRIS, A. W., Addition and Correction: On Steady Three-Dimensional Motions 381

MATKOWSKY, B. J., see HABETLER, G. J. 166

MAZZONE, S., Existence and Regularity of the Solution of Certain Nonlinear Variational Inequalities with an Obstacle 115

MEIXNER, J., Coldness and Temperature 281

MOECKEL, G. P., Thermodynamics of an Interface 255

MORGAN, A. J. A., Inhomogeneous Materially Uniform Higher Order Gross Bodies 189

MURDOCH, A. IAN, see GURTIN, MORTON E. 291

OSTER, G. F., see PERELSON, A. S. 31

PAYNE, L. E., see HERSCH, J., *et al.* 99

PERELSON, A. S., & G. F. OSTER, Chemical Reaction Dynamics. Part II: Reaction Networks 31

PODIO GUIDUGLI, P., see CAPRIZ, G. 1

SCHAEFFER, D. G., An Example of Generic Regularity for a Non-Linear Elliptic Equation 134

SCHIFFER, M. M., see HERSCH, J., *et al.* 99

TRUDINGER, N. S., On the Comparison Principle for Quasilinear Divergence Structure Equations 128

WHICKER, D., see LIANIS, G. 325

EDITORIAL BOARD

S. AGMON
The Hebrew University
Jerusalem

S. ANTMAN
University of Maryland
College Park

R. ARIS
University of Minnesota
Minneapolis

B. D. COLEMAN
Mellon Institute of Science
Pittsburgh, Pennsylvania

C. DAFERMOS
Brown University
Providence, Rhode Island

A. ERDÉLYI
Mathematical Institute
The University of Edinburgh

J. L. ERICKSEN
The Johns Hopkins University
Baltimore, Maryland

G. FICHERA
Istituto Matematico
Università di Roma

H. GÖRTLER
Institut für Angewandte Mathematik
Universität Freiburg i.Br.

M. E. GURTIN
Carnegie-Mellon University
Pittsburgh, Pennsylvania

D. D. JOSEPH
University of Minnesota
Minneapolis

J. L. LIONS
Département de Mathématiques
Université de Paris

J. B. McLEOD
Oxford University
Oxford, England

I. MÜLLER
The Johns Hopkins University
Baltimore, Maryland

J. C. C. NITSCHE
University of Minnesota
Minneapolis

W. NOLL
Carnegie-Mellon University
Pittsburgh, Pennsylvania

M. M. SCHIFFER
Stanford, University
California

J. SERRIN
University of Minnesota
Minneapolis

E. STERNBERG
California Institute of Technology
Pasadena, California

G. STRANG
Massachusetts Institute of Technology
Cambridge, Massachusetts

R. A. TOUPIN
Watson Research Center
Yorktown Heights, New York

C. TRUESDELL
The Johns Hopkins University
Baltimore, Maryland

C.-C. WANG
Rice University
Houston, Texas

ARCHIVE

for

RATIONAL MECHANICS

and

ANALYSIS

CONTENTS

GURTIN, M. E., & A. IAN MURDOCH, A Continuum Theory of Elastic Material Surfaces 291

LIANIS, G., & D. WHICKER, Electromagnetic Phenomena in Rotating Media 325

DUSSAN V., E. B., Hydrodynamic Stability and Instability of Fluid Systems with Interfaces 363

MARRIS, A. W., Addition and Correction: On Steady Three-Dimensional Motions 381

DUNWOODY, J., Errata: One Dimensional Shock Waves in Heat Conducting Materials with Memory 385

Printers: Universitätsdruckerei H. Stürtz AG, Würzburg

Printed in Germany — © by Springer-Verlag Berlin Heidelberg 1975